

STUDIES IN *DIANELLA* LAM. EX JUSS. (PHORMIACEAE) 2

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Summary

Dianella fruticans, from south central Queensland, is described as new and its relationship to other species of the Phormiaceae is discussed. The legitimacy of *Dianella odorata* Blume is reviewed. It is concluded this is a legitimate name. *Dianella brevipedunculata* R. Henderson, confined to Queensland, is recorded for the Maranoa pastoral district at a site more than 350 km north-west of its previously known most westerly occurrence, and from the Port Curtis pastoral district at a site in the tropics at least 100 km north-west of its previously known most northerly occurrence.

Introduction

This is the second of my papers dealing with taxonomy and nomenclature in *Dianella* Lam. ex Juss., included variously in Phormiaceae (Henderson & Clifford 1984) or, in the system of Cronquist (1981), in Liliaceae (Henderson 1987). Since the first paper appeared (Henderson 1988), a new species of *Dianella* has been found in Queensland and this needs formal naming. The legitimacy of the name *Dianella odorata* Blume, presently accepted for a taxon in northern Australia, needs consideration as Fosberg and Sachet (1987) listed that name as illegitimate. A major and a minor extension to the distributional range of *Dianella brevipedunculata* R. Henderson have been noted and are worth recording.

1. New *Dianella* species from Queensland

A very unusual specimen, apparently of a *Dianella* species, was collected from the Mount Moffatt section of the Carnarvon National Park in south central Queensland by Mr Barry Jahnke in September 1986. The material was not complete, being only a twig with a young inflorescence with immature flower buds. Basal portions of plants, including rhizomes and roots as well as flowers and fruits, are necessary for positive identification of *Dianella* material. Even so, Jahnke's specimen suggested that, if it belonged to that genus, it represented a completely new species. A trip to examine the plants *in situ* in late 1987 yielded only sterile specimens, and transplants to Brisbane languished and subsequently died. In December 1987, a sterile specimen of the same plant, from the difficult-to-access Ka Ka Mundi section of the park, was submitted to the Queensland Herbarium for identification. The Mount Moffatt section was ravaged by bushfires in late 1988 ruling out a visit to the site that year. In December 1989, a colleague, Ms Megan Thomas, collected scant flowering material of it from there which all but proved the plant belonged to *Dianella*. A visit to the park in February 1990 produced ripe fruit which confirmed that this plant indeed belongs to an entirely new species of that genus.

***Dianella fruticans* R. Henderson sp. nov.** ab speciebus omnibus aliis *Dianellae* Lam. ex Juss. perspicue propria sed forsan *D. incollatae* R. Henderson propinquissime affinis. Caulibus aëribus 0.5–3 m longis, surculis extra-vaginalibus systema extensum ramorum facientibus, foliis brevibus prope basin equitantibus, griseo-viridibus, apice parum recurvis (non cucullatis) et vagina foliorum proximale perfecte apertis, floribus viridi-caeruleis in inflorescentiis contractis decurvis ultra folia apicalia caulium vel ramorum breviter extensis portatis distinguitur. **Typus: Queensland.** MARANOA DISTRICT: NW of Marlong Plain on a sandstone ridge of the Chesterton Range, Mt Moffatt Section, Carnarvon National Park, 23 November 1990, R.J.F. Henderson H3503 & P. Robins (holo: BRI(2 sheets); iso: CANB, K, NSW, distribuendi).

Plants caespitose, perennial, to c. 2 m high; tufts open, to c. 50 cm across at base; roots fibrous-fleshy, some with fleshy tubers to 20 cm long and 2.5 cm across 15–25 cm from the rhizome; aerial stems ascending to decumbent, 0.3–3 m long, leafy throughout, ultimately bare for most of their length due to leaf drop. Leaves distichous, evenly dispersed along aerial stems, 5–20 cm long, grey green, glaucous; sheaths equitant, slightly ridged abaxially, slightly occluded distally where \pm V-shaped transversely, \pm indistin-

gishable from blade, minutely auriculate proximally and not forming any tube round the stem; blades 0.6–1.2 cm across, complicate or incurving (inrolling when dry), ultimately acute at the outwardly curving tip, smooth or minutely and irregularly sparsely scabrid on margins distally and midrib abaxially; veins distinct, slightly raised on upper and lower surfaces. Inflorescence contracted, open, irregular in outline, interrupted, arcuately curving, \pm within leaf canopy; bracts from c. 3.5 cm (lower) to c. 2 mm (upper) long, sheathing at base; bostryces condensed, 1(?)–3-flowered; pedicels slightly arcuate or straight, 0.5–1.0 mm long, rounded throughout. Perianth segments narrowly ovate to elliptic, pale bluish yellowish green; sepals obtuse, cucullate, 7–8 mm long, 5-nerved; petals obtuse-emarginate, 6.5–7 mm long, 5-nerved. Stamen filaments 2.5–3 mm long, kinked; struma globular, yellow, c. 1 mm long; anthers pale yellow, 3–3.5 mm long, tapered upwards. Ovary depressed globular, c. 1.8 mm across; ovules 6–8 per locule; style c. 4.5 mm long, with stigmatic papillae on the truncate apex. Berry depressed globular but obscurely trilobed at maturity, to c. 1.2 cm wide and 1 cm long, purplish blue; seed 4.3–4.7 \times 3–3.6 \times 2–2.5 mm; testa smooth, black, glossy; hilum punctiform. **Fig. 1.**

Specimens examined (all BRI): Queensland. LEICHHARDT DISTRICT: Mt Moffatt Section, Carnarvon National Park, 24°54'S 147°59'E, along walk to Kenniff's Cave from car-park (c. 80 km SW of Rolleston), Oct 1987, *Henderson* H3089; ditto, Dec 1989, *Thomas & Geeves* [AQ 459253]; ditto, Feb 1990, *Henderson* H3340 & *Franks*. WARREGO DISTRICT: Ka Ka Mundi section of Carnarvon National Park, 24°4–S 147°2–E, Dec 1987, *Kelly* DK1. MARANO DISTRICT: Mt Moffatt section of Carnarvon National Park, on top of scarp to NW of Marlong Plain, 24°55'S 147°56'E, Sep 1986, *Jahnke* [AQ 367491]; Mt Moffatt Section, Carnarvon National Park, NW of upper Marlong Plain (c. 90 km SW of Rolleston and 14 km N of park headquarters), Feb 1990, *Henderson* H3342 & *Franks*; ditto, Nov 1990, *Henderson* H3503 & *Robins* (TYPE).

Distribution and habitat: *D. fruticans* is known only from the Ka Ka Mundi and Mount Moffatt sections of the Carnarvon National Park in south central Queensland (**Map 1**). In localities seen, the plant occurs sparsely in rocky sandstone outcrops in open eucalypt forest on the crest or upper slopes of sandstone ridges. One site faces north east and is on the Great Dividing Range, the other two face south east and are on the Chesterton Range not far from its junction with the Great Dividing Range. The roots seem few and thickened and are wedged well down in sand and organic material in cracks in the rock. At no site are there extensive populations of the plant.

Phenology: The plant flowers in spring to early summer and fruits in mid to late summer.

Relationships: *D. fruticans* is clearly distinct from all other species of *Dianella* and at first sight may be considered to belong to a distinct genus, so different is its vegetative appearance. However, its stamens with a squat filament struma and a straight anther remaining straight after dehiscence, and blue fleshy berries with shiny black seeds with punctiform hilum clearly show it belongs in *Dianella*.

In habit it is similar to *Rhuacophila javanica* Blume from Indonesia to New Caledonia and Fiji, and has lower bracts similar to those of that species, but the floral attributes mentioned above exclude it from *Rhuacophila*. It also shows similarity with *Stypandra glauca* R. Br. from Australia in habit, but again the above attributes exclude it from *Stypandra*. Within *Dianella* it is apparently, because of the little-occluded leaf sheaths, most closely related to *D. incollata* R. Henderson from sandstone areas in far north Queensland. It is distinguishable from that by its longer aerial stems which develop an extensive branching system from primary, secondary and tertiary extra-vaginal shoots in upper regions of the stems and branches. Also, it has shorter, equitant (rather than distinctly patent), grey-green, inrolling leaf blades and pale green-blue flowers in contracted, decurving inflorescences extending only a little beyond the apical leaves on each stem or branch (rather than an open and exerted inflorescence).

In its stem system it shows similarities to *D. bambusifolia* H. Hallier, *D. caerulea* var. *protensa* R. Henderson, *D. caerulea* var. *assera* R. Henderson, *D. pavopennacea* R. Henderson var. *pavopennacea* and *D. pavopennacea* var. *major* R. Henderson but these are clearly distinct in attributes of leaves and/or the inflorescence, and none of them has large tubers produced on only some of their roots.

Notes: In my key to Australian species of *Dianella* given in *Flora of Australia* (Henderson 1987), *D. fruticans* keys to couplet 10/10. Leads 10/10: and 11/11: should be modified as follows.



Fig. 1. *Dianella fruticans*: A. habit of plants $\times c. 0.03$. B. branch apex with young inflorescence $\times 0.3$. C. branch apex with inflorescence bearing buds and fruits $\times 0.67$. D. transverse section of leaf lamina $\times 2$. E. transverse section of leaf in zone of occlusion $\times 2$. F. flower with a petal and stamen removed $\times 4$. A, Henderson H3342 & Franks; B, Jahnke [AQ 367491]; C,D, Henderson H3503 & Robins.

- 10 Margins of leaf lamina smooth or with occasional minute pricklets particularly distally
- 10A Leaf lamina venation parallel; intervein areas opaque; pedicels \pm straight, divaricate, 0.5–10 mm long; petals 5-nerved; lateral faces of seed smooth (southern central Qld) **D. fruticans**
- 10A: Leaf lamina venation \pm scalariform; intervein areas translucent
- 11 Pedicels arching or spreading, 12–25 mm long; petals 5-nerved; lateral faces of seed areolate but smooth and evenly convex (northern Qld & northern N.T.) **D. odorata**
- 11: Pedicels \pm straight, erect or ascending, 1.5–10 mm long; petals 3-nerved; lateral faces of seed alveolate and irregularly ridged (northern Qld) **D. bambusifolia**
- 10: Margins of leaf lamina regularly serrulate-scabrous virtually throughout; venation parallel or scalariform; intervein areas opaque or translucent
- 12 Leaf lamina \pm coriaceous; ... etc.

Conservation status: From its present-known distribution and occurrence in a declared National Park, a conservation code of 2RCt (see Briggs & Leigh 1988) is appropriate.

Etymology: The specific epithet *fruticans*, Latin for ‘growing into a shrub-like plant’, refers to the habit of the plant throughout its life span.

2. In defence of *Dianella odorata*

I have used the name *Dianella odorata* Blume for a taxon occurring in northern and north-eastern Australia extending from Bathurst Island, Northern Territory to Hinchinbrook Island, Queensland and including coastal areas on the mainland between (Henderson 1987). This taxon also occurs in Indonesia. Fosberg and Sachet (1987) in describing *Dianella saffordiana* from Guam included in the synonymy “*Dianella odorata* sensu Schlittler, 1957 non Bl. 1827 (nom. – superfl. illegit.)” and in discussion about a specimen in US (*C.B. Robinson* 505) say that it is referable to “*D. odorata* Bl. (nom. illegit.)”. Incidentally, I examined *C.B. Robinson* 505 on loan from US (Sheet 654815) several years ago (c. 1976) and considered it belongs with *D. odorata*, as Drs Fosberg and Sachet have suggested.

In correspondence, Dr Fosberg explained his opinion on the legitimacy of Blume’s name as follows.

“My point about *Dianella odorata* Bl. is that Blume’s citation of *Dracaena ensifolia* Lour., a somewhat indirect reference to *Dracaena ensifolia* L., in synonymy makes *Dianella odorata* Bl. superfluous and therefore illegitimate. I think there is little doubt that Loureiro was merely using the Linnean name, rather than creating a new species.”

When describing *Dianella odorata* as new, Blume (1827) based his description on plants growing in gardens in what is now Indonesia and specifically on a specimen from “Archipel. indic.”, collector unknown, now housed in the Leiden herbarium (Herb. Lugd. Bat. 908.106 738). In addition to a description, his protologue included a diagnosis distinguishing the plant from *Dianella revoluta* R. Br., and two references as follows.

“*Dracaena ensifolia*. Lour. Cochinch. 1. p. 243. 2.
Gladiolus odoratus. Rumph. amb. 5. p. 145, t.73.”

(As it happens, the page and species number references given here for Loureiro’s Flora by Blume relate to the second edition edited by C.L. Willdenow, published in 1793 (Stafleu & Cowan 1981). Loureiro dealt with *Dracaena ensifolia* on page 197 of the first edition of his Flora (1790). Blume apparently had no access to this.)

I agree with Dr Fosberg on his last point. There can be no doubt that Loureiro, in 1790, was dealing with a taxon (or taxa) from field localities in Cochinchina (Indo-China) for which he used the name *Dracaena ensifolia*, following Linnaeus (1767), and not describing a species anew as *Dracaena ensifolia*. Merrill (1935) came to this conclusion too in his commentary on Loureiro's Flora. Loureiro considered his plants conspecific with Linnaeus's and also with plants Rumphius (1747) called *Gladiolus odoratus indicus*, probably because Linnaeus cited Rumphius's plate in his protologue of *Dracaena ensifolia*. Merrill explained in detail Loureiro's often misinterpretation (more than 56% overall) of Linnaeus's taxa, and his basis for interpreting those taxa in relation to the plants dealt with in Flora Cochinchinensis. In the case of *Dracaena ensifolia* though, Merrill agreed with Loureiro's application of Linnaeus's name, and accepted *Dianella ensifolia* (L.) DC. for Loureiro's Indo-China plants. He noted, however, they are not conspecific with Rumphius's Amboina ones.

"*Dracaena ensifolia* Loureiro", or more correctly *Dracaena ensifolia* sensu Loureiro, is therefore a taxonomic grouping which may or may not correspond to the taxon Linnaeus called *Dracaena ensifolia*. Linnaeus seemingly did not see the plants Loureiro described and it is doubtful that Loureiro saw the specimens in Linnaeus's herbarium which formed the main basis of his protologue description (Merrill 1917, p. 136). As Merrill (1935) pointed out, Loureiro's concept of the species covered plants of (at least) two species. Linnaeus's concept of *Dracaena ensifolia* also encompassed plants of more than one species (Henderson 1977, 1987) one of which was represented by Rumphius's plate. Article 48 of the International Code of Botanical Nomenclature (ICBN) (Greuter *et al.* 1988), dealing with an author using an existing name but excluding its type from the taxon he applied it to, thus surely cannot apply. I consider, therefore, "*Dracaena ensifolia* Loureiro", being a taxonomic grouping, is of no nomenclatural significance.

For Article 63 of the ICBN to be invoked to render *Dianella odorata* Blume superfluous and illegitimate, Blume would have to have "definitely included" within his circumscription of that species "the holotype or *all* syntypes or the *previously designated* lectotype" (my emphasis) of an earlier name that ought to have been adopted, or whose epithet ought to have been adopted, under the rules. Inclusion of a type is understood to mean (ICBN Art. 63.2)

- a. the citation of the type specimen,
- b. citation of an illustration of the type specimen,
- c. citation of the type of a name, or
- d. citation of the name itself unless the type is at the same time excluded either explicitly or by implication.

In publishing the name *Dianella odorata*, Blume cited no specimens of any kind so criteria a. and c. do not apply. To argue that he indirectly cited type specimens by citing the references he did, seems an obscure interpretation of the word 'citation' and is not convincing. Rumphius's table 73 in volume 5 of his Herbarium Amboinense was one of the syntypes (now a lectoparatype) of the name *Dracaena ensifolia* L., so criterion b. can be taken to be applicable to this element. However, all other syntype material would also have to have been definitely included for citation of this table to be relevant for no lectotype had been chosen for the name by 1827 (Art. 63.1). Blume did not cite *Dracaena ensifolia* L. (the name itself) in his protologue so criterion d. does not apply either. It is acknowledged that Linnaeus (L.) is not part of the name as defined by ICBN Article 23, but citation of the author of a name is mandatory for the following requirements concerning the type in criterion d. to be relevant. The only part of Article 63.2 dealing with implication relates to the exclusion of 'the type' (? holotype) of a name, which in the case of *Dracaena ensifolia* L. would probably not apply anyway as that has no holotype. Inclusion of type material depends on direct citation of it.

Blume clearly was fully aware of Linnaeus's names for under "*Dianella*, Lam." on page 12 of his Enumeratio, he included "*Dracaenae* sp. Linn.". In addition, the specimen at L considered to be and marked as (holo)type of *Dianella odorata* Blume (by both an unknown hand (presumably not Blume's) and J. Schlittler in June 1947) was originally determined "*Dracaena ensifolia*, Linn.". The original label is then annotated, presumably in Blume's hand, "*Dianella odorata* Bl./ media intr. D. divaricatus et

D. rarum, a priori differt panicula simplici ramisque strictis. a *D. rara* autem foliis lineari-ensiformibus haud linearibus/fig. Rumph. optima”.

Blume chose to ignore Linnaeus's epithet and was guided by Rumphius's plate and polynomial *Gladiolus odoratus indicus* in choosing the epithet "odorata". There is no evidence that Blume saw that part of Linnaeus's "original material" subsequently chosen as lectotype of his name, a specimen in Linnaeus's herbarium in LINN. From the foregoing then, it is clear he cannot be considered to have definitely included all syntypes of Linnaeus's name within his circumscription of *Dianella odorata*.

In summary then, I contend that Blume's name *Dianella odorata* is legitimate for the following reasons:

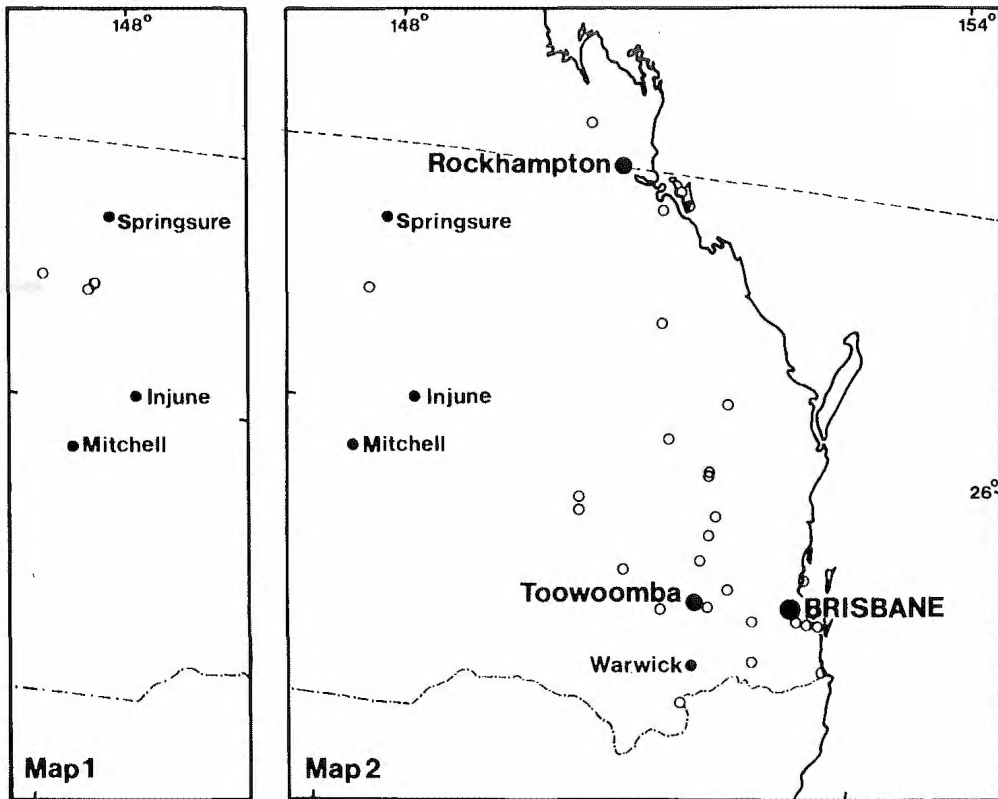
1. He was describing a new taxon distinct from that covered by the name *Dracaena ensifolia* L. (as currently lectotypified), based on a specimen (or specimens) from "Indiae orientalis" (Indonesia) at his disposal (Blume 1827, Praef.). He considered these conspecific with Rumphius's plants from Amboina (also in the area covered by his Enumeratio).
2. Though he thought his plants were conspecific with the plants Loureiro included under *Dracaena ensifolia* (based on the latter's incidental citation of Rumphius's plate), he did not realise Loureiro's use of that name covered at least two different species.
3. Had he considered his plants conspecific with Linnaeus's he would have used the latter's name, as he did two pages earlier in his Enumeratio in accepting *Dracaena terminalis* L. for other local (Indonesian) plants, or made the necessary transfer of the epithet to *Dianella* for them.
4. He did not publish a superfluous name for his (Indonesian) plants by mentioning Willdenow's re-publication of Loureiro's application of a previously published name to Indo-China plants and his misapplication of that name to Rumphius's (Indonesian) plants.

Recognition of *Dianella odorata* as legitimate, I believe, best serves the original author's intent, as evidenced by his published opinion, and is in line with the opinion of many subsequent authors (Merrill 1917, pp.136 & 137). We can, therefore, continue to use the name for some of our Australian *Dianella* plants.

3. Extensions to recorded distributional range of *Dianella brevipedunculata*

In undertaking field trips to collect material of *Dianella fruticans* in February and November 1990, I found extensive stands of *Dianella brevipedunculata* R. Henderson that greatly extend the known distributional range of the species. The first is on sandy alluvial flats beside tributaries of Marlong Creek, north-west of Marlong Plains, and below sandstone ridges of the Chesterton Range in the Mount Moffatt section of the Carnarvon National Park. The vegetation of this site is open eucalypt forest with a ground cover of mostly grasses. The other occurrence of the species is along a small tributary of the Fitzroy River near Canoona, about 50 km north-west of Rockhampton. At that site, the vegetation is eucalypt forest with predominantly grassy ground cover abutting fringing forest of mainly *Casuarina cunninghamiana* Miq. and *Callistemon viminalis* (Sol. ex Gaertner) G. Don ex Loudon, all growing on serpentinite-derived soils.

D. brevipedunculata is a most adaptable and easily identifiable species which grows in forest habitats from beside the sea east of Brisbane, to areas at c. 900 m altitude in the Bunya Mountains (south-east Queensland), from near Marlborough, north-west of Rockhampton, to the Queensland/New South Wales border and westward to the foot of the Chesterton Range, north-west of Roma. The newly established western record extends the species' known distribution some 250 km westward of its previously known western limit and is approximately 360 km from the nearest previously known population of it. The newly established northern occurrence extends the species' limit into the tropics, to a site at least 100 km north-west of the previously known most northerly population of it. Map 2*.



Maps 1 & 2. Distribution of *Dianella* spp.: 1. *D. fruticans*. 2. *D. brevipedunculata*.

To vouch for these records, relevant specimens (*Henderson* H3507 & *Robins* for the westerly occurrence, *Henderson* H3491 & *Robins* for the northerly one) have been lodged in BRI.

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*Note in proof: A further population of *D. brevipedunculata* has been found E of Springsure, the first BRI record of the species in Leichhardt Pastoral District. Details of the voucher are E slopes of Expedition Ra., c. 45km E of Rolleston, Jun 1991, *Henderson* H3512 & *Thompson* (BRI).